

REMARKS

Claims 1-10 and 12-28 are presently pending. Claim 11 has been canceled. Claims 1, 3, 6, 8-10, 12-14, 16 and 26 have been amended. Claims 2, 4, 5, 7, 17-25, 27 and 28 have been withdrawn from consideration as directed to a non-elected invention.

Applicant reserves the right to file a divisional application in order to prosecute claims directed to the non-elected inventions, if desired.

Applicant respectfully requests reconsideration of the application in view of the foregoing amendments and the remarks appearing below.

Affirmation of Telephonic Election

The Examiner has indicated that affirmation of the election made during a telephonic Restriction Requirement on April 13, 2004, is required. Applicant hereby affirms for immediate prosecution on the merits the election of the invention of Group 1, species b, to which claims 1, 6, 8, 9, 11-15 and 26 are drawn.

Rejection under 35 U.S.C. § 102***De Vaan***

The Examiner has rejected claims 1, 14, 15 and 26 under 35 U.S.C. § 102(b) as being anticipated by European Patent Application No. 0 467 447 A1 to De Vaan, stating that De Vaan discloses an optical system having all of the limitations of these claims. Applicant respectfully disagrees.

De Vaan discloses an image projecting apparatus for projecting images onto a screen or other viewing device. The De Vaan apparatus includes cholesteric liquid crystals (CLCs) as a means of recuperating otherwise lost light to increase the efficiency of the apparatus and decrease the operating temperature of the apparatus as compared to similar conventional screen-type projectors.

Regarding independent claim 1, this claim, as amended, includes the limitation that the at least one converging element comprises the broadband reflector-polarizer that is in the optical path between the at least one converging element and the real image and opposite the source. This limitation was originally present in claim 11, which the Examiner has indicated as being

allowable over the references of record. Consequently, claim 1, as well as claims 2 and 7 that depend therefrom, are allowable.

Regarding independent claim 26, this claim, as amended, requires an optical system and at least one image source providing a source image, wherein the optical system is configured, and spaced from the at least one image source, so as to form a real floating image of the source image in real space. In contrast, the De Vaan apparatus is a projector for projecting images onto a viewing device, not for projecting real floating images into space. An image projected onto a viewing surface is neither a real floating image nor an image formed in real space. Consequently, the De Vaan apparatus does not include the above-identified limitation of amended claim 26. Since the De Vaan apparatus does not include all of the limitations of amended claim 26, it cannot anticipate this claim, nor claims 3-6, 8-10, 12-16, 27 and 28 that depend therefrom.

For at least the foregoing reasons, Applicant respectfully requests that the Examiner withdraw the present rejection.

Hoppe

The Examiner has rejected claims 1, 6, 8, 12 and 13 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,715,023 to Hoppe, stating that Hoppe discloses an optical system having all of the limitations of these claims. Applicant respectfully disagrees.

Hoppe discloses an image display system that forms a collimated (or infinity or virtual) image, wherein the image appears at or near infinity behind the display itself. Such images are used, e.g., in the simulation of distant terrain images.

Regarding independent claim 1, as discussed above in connection with the anticipation rejection in view of the De Vaan reference, Applicant has amended claim 1 to include the limitation of original claim 11, which the Examiner found to be allowable. Consequently, Applicant submits that amended claim 1 is allowable.

Regarding claims 6, 8, 12 and 13, each of these claims, as amended, now depend from amended independent claim 26, which, as discussed above relative to the anticipation rejection in view of the De Vaan reference, requires an optical system and at least one image source providing a source image, wherein the optical system is configured, and spaced from the at least

one image source, so as to form a real floating image of the source image in real space. In contrast, the optical system of the Hoppe image system is configured, and spaced from the image source(s), so as to form a virtual image, not a real floating image in real space. For example, the element of the Hoppe system that the Examiner asserts to be the converging element of claims 6, 8, 12 and 13 is actually a diverging element that produced the virtual collimated image. Consequently, the Hoppe patent cannot anticipate claims 6, 8, 12 and 13, nor amended claim 26 from which each of these claims depend.

For at least the foregoing reasons, Applicant respectfully requests that the Examiner withdraw the present rejection.

Rejections under 35 U.S.C. § 103

Hoppe and Broer et al.

The Examiner has rejected claims 1, 6, 8, 12 and 13 under 35 U.S.C. § 103 as being obvious in view of the Hoppe patent, discussed above, and further in view of European Patent Application No. 0 606 940 A2 to Broer et al., stating that Hoppe discloses all of the limitations of these claims except, perhaps, for a broadband reflector-polarizer. The Examiner then states that Broer et al. disclose the potentially missing limitation and asserts that it would have been obvious to a person having ordinary skill in the art at the time of the invention to provide the Hoppe optical system with a broadband reflector-polarizer as disclosed by Broer et al. Applicant respectfully disagrees.

The Hoppe disclosure is described above relative to the anticipation rejection in view of same. Broer et al. disclose a CLC polarizer.

Regarding independent claim 1, as discussed above relative to the anticipation rejections, Applicant believes that this claim is patentable over the references of record since it incorporates the subject matter of original claim 11, which the Examiner indicted as being allowable.

Regarding claims 6, 8, 12 and 13, as also discussed above in connection with the anticipation rejection in view of the Hoppe patent, Hoppe does not disclose an optical system configured, and spaced from an image source, so as to form a real floating image of a source image in real space, as required by these claims due to their dependency from amended independent claim 26. Rather, Hoppe discloses an optical system for forming virtual images.

Broer et al. also do not disclose an optical system configured, and spaced from an image source, so as to form a real floating image of a source image in real space. Consequently, any combination of the Hoppe and Broer et al. references would lack this limitation of claims 6, 8, 12 and 13.

Moreover, to assert that the Hoppe system could be modified so as to form a real floating image would be to destroy the functionality of the Hoppe system, which is intended to be a virtual image system that is much different from the real floating image forming system of claims 6, 8, 12 and 13. Consequently, those skilled in the art would not be motivated to make the modifications to the Hoppe and/or Broer et al. systems that would be necessary to create an optical system that forms real floating images in real space.

For at least the foregoing reasons, Applicant respectfully requests that the Examiner withdraw the present rejection.

Tanaka et al. and Hoppe (Tanaka, Hoppe and Broer et al.)

The Examiner has rejected claims 1, 6, 8, 9, 12, 13 and 26 under 35 U.S.C. § 103 as being obvious in view of U.S. Patent No. 5,853,240 to Tanaka et al. and the Hoppe patent, discussed above, or, alternatively, the Tanaka et al. and Hoppe references further in view of the Broer et al. reference, discussed above, stating that Tanaka et al. disclose all of the limitations of these claims except for a broadband reflector-polarizer. The Examiner then states that Hoppe or, alternatively, Hoppe and Broer et al. disclose the missing limitation and asserts that it would have been obvious to a person having ordinary skill in the art at the time of the invention to provide the Tanaka et al. optical system with a broadband reflector-polarizer as disclosed by Hoppe or Hoppe and Broer et al. Applicant respectfully disagrees.

The disclosures of Hoppe and Broer et al. are as discussed above, respectively, in connection with the anticipation rejection in view of the Hoppe patent and the obviousness rejection in view of the Hoppe and Broer et al. references. Tanaka et al. disclose a micro display having a corrective optic enhancement for use in a heads-up display (i.e., virtual, or infinity, image display) or, alternatively, as a projector for projecting images onto a screen or other viewing device.

Regarding independent claim 1, as discussed above relative to the anticipation rejections, Applicant submits that this claim is patentable over the references of record since it incorporates the subject matter of original claim 11, which the Examiner indicted as being allowable.

Regarding claims 6, 8, 12, 13 and 26, each of these claims requires an optical system configured, and spaced from an image source, so as to form a real floating image of a source image in real space. Tanaka et al. do not disclose such a system, but rather a screen-type projection system (generally like the De Vaan apparatus discussed above) or a virtual image forming system (generally like the Hoppe system discussed above). Again, Broer et al. also do not disclose an optical system configured, and spaced from an image source, so as to form a real floating image of a source image in real space. Consequently, any combination of the Tanaka et al., Hoppe and Broer et al. references would lack the above-identified limitation of claims 6, 8, 12, 13 and 26.

Moreover, to assert that the Tanaka et al. and/or Hoppe systems could be modified so as to form a real floating image would be to destroy the functionality of these systems, which are each intended to be either a virtual image system or a screen-type projecting system that are both much different from the real floating image forming system of claims 6, 8, 12, 13 and 26. Consequently, those skilled in the art would not be motivated to make the modifications to the Tanaka et al., Hoppe and/or Broer et al. systems necessary to create an optical system that forms a real floating image in real space.

For at least the foregoing reasons, Applicant respectfully requests that the Examiner withdraw the present rejection.

De Vaan and Schadt et al. (De Vaan and Schadt et al. and Broer et al.)

The Examiner has rejected claims 1, 13-15 and 26 under 35 U.S.C. § 103 as being obvious in view of the De Vaan reference, discussed above, and publication, Schadt et al. "Novel Polarized Liquid-Crystal Color Projection and New TN-LCD Operating Modes," SID 90 DIGEST (1990) and, alternatively, further in view of the Broer et al. reference, discussed above, stating that De Vaan discloses all of the limitations of these claims except for a cholesteric reflector-polarizer. The Examiner then states that Schadt et al. or, alternatively, Schadt et al. and Broer et al. disclose the missing limitation and asserts that it would have been obvious to a

person having ordinary skill in the art at the time of the invention to provide the De Vaan apparatus with a cholesteric reflector-polarizer as disclosed by Schadt et al. or Schadt et al. and Broer et al. Applicant respectfully disagrees.

The disclosures of De Vaan and Broer et al. are as discussed above, respectively, in connection with the anticipation rejection in view of the De Vaan reference and the obviousness rejection in view of the Hoppe and Broer et al. references. Schadt et al. disclose a projecting system for projecting an image onto a screen or other viewing device. The Schadt et al. projecting system includes CLC filters.

Regarding independent claim 1, as discussed above relative to the anticipation rejections, Applicant believes that this claim is patentable over the references of record since it incorporates the subject matter of original claim 11, which the Examiner indicted as being allowable.

Regarding claims 13-15 and 26, each of these claims requires an optical system configured, and spaced from an image source, so as to form a real floating image of a source image in real space. None of the applied references disclose such an optical system. Consequently, any combination of the De Vaan and Schadt et al. and/or Broer et al. references would lack this limitation of claims 13-15 and 26.

Moreover, to assert that the systems of the De Vaan and Schadt et al. references could be modified so as to form a real floating image would be to destroy the functionality of these systems, which are each intended to be a screen-type projecting system that is much different from the real floating image forming system of these claims. Consequently, those skilled in the art would not be motivated to make the modifications to the De Vaan and Schadt et al. and/or Broer et al. systems necessary to create an optical system that forms a real floating image in real space.

For at least the foregoing reasons, Applicant respectfully requests that the Examiner withdraw the present rejection.

Conclusion

In view of the foregoing, Applicants respectfully submit that claims 1-16 and 26-28, as amended, are in condition for allowance. Therefore, prompt issuance of a Notice of Allowance

is respectfully solicited. If any issues remain, the Examiner is encouraged to call the undersigned attorney at the number listed below.

Respectfully submitted,
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